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### THESIS

**A STATISTICAL ANALYSIS OF THE  
U.S. MARINE CORPS LIEUTENANT COLONEL  
COMMAND SCREENING PROCESS**

by

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September, 1997

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In 1992, the U.S. Marine Corps instituted a Command Screening Program (CSP) to annually select the most qualified Lieutenant Colonels (LtCols) to command. Prior to the CSP, the selection of Commanding Officers (COs) was left to the decision of the Commanding Generals. This thesis establishes the methodology, conducted with the current data available, to determine if the CSP is a "better" CO selection process and if there is an overall career advantage for LtCols who command. Fitness report information, without performance markings, was obtained for 3,417 officers. Each officer was placed into one of four mutually exclusive groups, first dependent on whether the officer was a CO as a LtCol or not and second whether retired or promoted prior to June 1, 1993 (the date the CSP took effect) or not. Measures of Effectiveness (MOEs) include the mean duration of a command tour, the proportions promoted, passed over, and voluntarily retired, and the proportion promoted "early, on time, or late." Hypothesis tests are conducted on the pairwise comparison of group proportions for each MOE. The results, based on the MOEs, are somewhat mixed but generally indicate that the CSP is selecting more effective COs, and that there is a career advantage for LtCols who command. The results will be more convincing as the CO group that began command after June 1, 1993 gains more time in service and more time in rank. Currently only 8.9% of this group has voluntarily retired or been in the promotion zone for Col.

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LIEUTENANT COLONEL COMMAND SCREENING PROCESS**

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In 1992, the U.S. Marine Corps instituted a Command Screening Program (CSP) to annually select the most qualified Lieutenant Colonels (LtCols) to command. Prior to the CSP, the selection of Commanding Officers (COs) was left to the decision of the Commanding Generals. This thesis establishes the methodology, conducted with the current data available, to determine if the CSP is a "better" CO selection process and if there is an overall career advantage for LtCols who command. Fitness report information, without performance markings, was obtained for 3,417 officers. Each officer was placed into one of four mutually exclusive groups, first dependent on whether the officer was a CO as a LtCol or not and second whether retired or promoted prior to June 1, 1993 (the date the CSP took effect) or not. Measures of Effectiveness (MOEs) include the mean duration of a command tour, the proportions promoted, passed over, and voluntarily retired, and the proportion promoted "early, on time, or late." Hypothesis tests are conducted on the pairwise comparison of group proportions for each MOE. The results, based on the MOEs, are somewhat mixed but generally indicate that the CSP is selecting more effective COs, and that there is a career advantage for LtCols who command. The results will be more convincing as the CO group that began command after June 1, 1993 gains more time in service and more time in rank. Currently only 8.9% of this group has voluntarily retired or been in the promotion zone for Col.



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## EXECUTIVE SUMMARY

### A. BACKGROUND

The purpose of the Command Screening Program is to ensure that Marines receive the best possible leadership and that every officer receives fair and equitable consideration for the opportunity to command. All Lieutenant Colonels who have served in Commanding Officer billets since June 1, 1993 have been selected for that position by an annual selection board of senior level officers. Prior to 1992, the selection of commanders was left to the decision of the division or wing level Commanding General in that unit's chain of command.

**This analysis determines whether the Command Screening Program is a "better" system of selecting battalion and squadron Commanding Officers than the method previously used for selection.** A large population of officers (3417) was divided into four mutually exclusive groups. The groups reflect whether or not an officer was affected by the Command Screening Board and whether or not he was a Commanding Officer at the rank of Lieutenant Colonel. The measures of effectiveness (MOEs) used in this analysis include the mean duration of a command tour, the proportions of officers voluntarily retiring, promoted and passed over for the rank of Colonel, the proportion promoted prior, within, or after their year group reached the primary zone for Colonel, and the proportion of officers who eventually hold a command billet at the rank of Colonel.

The conduct of the Command Screening Board is similar to that of a promotion board. Each eligible Lieutenant Colonel's career summary is briefed to the 14 members of the board, immediately followed by a vote as to whether the officer should be a Commanding Officer or not. The product of the board is a list of all officers who successfully "screened" for command, approximately 200% more than the anticipated requirement (in case officers initially offered commands decide to decline). The remainder of the eligible Lieutenant Colonels are considered "not screened." The assignment officers (monitors) then match an officer to a specific commanding officer billet. If an officer receives a Commanding Officer billet, then he is classified as "screened and slated," as opposed to the other "screened" officers who now become "screened, not slated." For this analysis, the officers are in either the "screened and slated" group (CO) or in the

combined group consisting of the "screened, not slated" and "not screened" officers (*Not CO*). Furthermore the officers are either not affected by the Command Screening Board (*Pre-CSB*) or they are affected by it (*Post-CSB*) depending when they assumed command, retired, or were promoted to Colonel.

## **B. DATA AND METHODOLOGY**

Zip Master Brief sheets, with all performance evaluations (fitness reports) for an officer's career, without the actual performance markings, were the sources for acquiring the pertinent information required to measure the MOEs on each of the 3417 officers. No other data source, in digital format, is as definitive in determining whether an officer actually possessed a true Commanding Officer fitness report or not.

The data was extracted from the data base of Headquarters Marine Corps, Performance Evaluation Branch, in December 1996. Each officer's record is current as of the last fitness report written, submitted, and entered into the data base prior to this date.

Common statistical tests, to include nonparametric methods, were used to analyze the MOEs.

## **C. RESULTS**

The Command Screening Process is more effective than the prior method of selection in the following MOEs. If the results indicated enough difference to be statistically significant, it is denoted by an asterisk (\*).

- A lower proportion of Commanding Officers has been passed over for the rank of Colonel. \*
- A higher proportion of Commanding Officers has been promoted early and on time to Colonel.
- A lower proportion of Commanding Officers has been promoted late to Colonel.
- A lower proportion of Commanding Officers has retired immediately at the end of their Lieutenant Colonel Commanding Officer billet. \*

The Command Screening Program possesses attributes that are supportive of the process other than those that were analyzed by the MOEs. For instance, all Lieutenant Colonels in the Marine Corps are considered for Commanding Officer billets under the new method of selection, whereas under the prior method a Commanding General had to choose from officers assigned to his command. Also, command assignments are managed by the monitors, hence an officer's career is managed to ensure he gets the best mix of staff and operational assignments required for positions of more responsibility.

There are also some drawbacks to the Command Screening Program when it is compared to the prior method of selecting Commanding Officers, with the MOEs selected for this analysis. Most notably, a lower proportion of officers have been promoted to Colonel. Instead a higher proportion has voluntarily retired (\*). Furthermore a lower proportion has gone on to be Colonel Commanding Officers (\*).

#### D. CONCLUSION

The Command Screening Process is achieving its stated objectives, as judged by most MOEs utilized in this analysis. More career highlights of the majority of officers affected by the Command Screening Process must come to pass before any statistically definitive decisions on the value of the process can be reached, however the trends of the proportions are generally favorable to the process. Having a Command Screening Program does make the selection of Lieutenant Colonel Commanding Officers a fair, formal process, and actually that alone makes it worth keeping.

An analysis, using the same methodology, needs to be conducted every two years, or so, to analyze the trends as the populations gain more time in service and more time in rank. The lack of follow-on career data of officers affected by the Command Screening Process decreased the amount of data available for analysis. For example, only 8.9% of the Commanding Officer population affected by the Command Screening Process have reached the career milestone of voluntarily retiring or being in the primary zone for the Colonel Promotion Board.

## **I. INTRODUCTION**

In 1992, the Commandant of the Marine Corps directed that a centralized process by which Lieutenant Colonels are evaluated and screened for battalion and squadron level commands be instituted. The Commandant wanted to ensure that the Marines of these units received the best possible leadership and that every officer received fair and equitable consideration for the opportunity to command. The Command Screening Program was the answer to this directive and remains in effect today. All Lieutenant Colonels who have served in Commanding Officer billets since June 1, 1993 have been selected for that position by the Command Screening Process. The board convenes annually, is comprised of senior level Marine Corps officers, and conducts their selection process similar to the method used by a promotion board. Prior to the institution of the Command Screening Program, the selection of commanders was left to the decision of the division or wing level Commanding General in that unit's chain of command.

The purpose of this analysis is to determine whether the Command Screening Program is a "better" system of selecting battalion and squadron Commanding Officers than the prior method. This evaluation required categorizing a large population of officers into four mutually exclusive groups. The groups reflect whether or not an officer was affected by the Command Screening process and whether or not he was a Commanding Officer at the rank of Lieutenant Colonel. The measures of effectiveness (MOEs) used in this analysis required certain specific information on each individual officer. The MOEs include the mean duration of command tours, the proportion of officers promoted to the rank of Colonel, the proportion of officers retiring, and the proportion of officers who eventually hold a command billet as a Colonel. The statistical analysis includes hypothesis tests for comparison of the groups, using the MOEs.

### **A. BACKGROUND**

The focus of the Command Screening Program is to ensure that the Marine Corps most precious asset, the Marines, are provided with the best possible leadership [Ref. 1]. There are four basic tenets within this focus upon which the program stands. The first of the tenets is to ensure Marines are led by the most qualified Lieutenant Colonels in the Marine Corps. The second tenet is to ensure that all Lieutenant Colonels are afforded an equal opportunity to compete for command. At Headquarters Marine Corps (HQMC) level, the records of all eligible Lieutenant Colonels are reviewed for possible selection as

a Commanding Officer, as opposed to the old system where a Commanding General had only those officers in his command from which to choose.

The third tenet is to formalize command assignments. This helps HQMC manage an officer's career, ensuring the officer gets the best mix of staff and operational assignments required for positions of more responsibility. The fourth and final tenet is to eliminate sponsorship and cronyism. Under the prior selection system, there was a possibility that an outstanding Lieutenant Colonel would not be selected for a Commanding Officer billet for the mere reason that a Commanding General did not know him. [Ref. 2]

## **B. COMMAND SCREENING PROCEDURES**

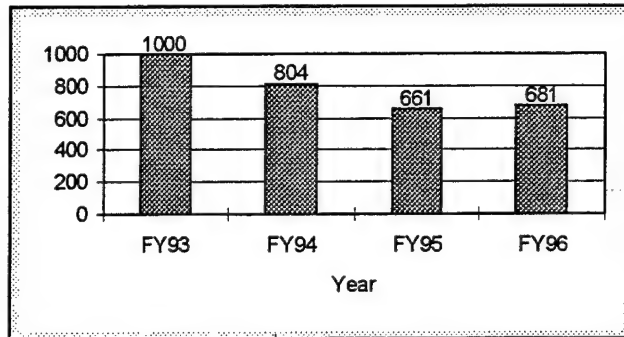
An annual Command Screening Board meets during July to select the Lieutenant Colonels who will occupy the Commanding Officer billets being vacated 12 to 24 months after the board convenes (slate year). The board consists of three General officers and eleven Colonels with diverse military occupational specialties and each with a broad breadth of experience. The precept of the board, given to them by the Commandant of the Marine Corps, is to select the best and most qualified officers to command Marine Corps battalions and squadrons.

Prior to this board, an annual billet validation has been completed. The billet validation determines which Commanding Officer billets will be vacated during the following slate year. There are 279 Commanding Officer billets in the entire Marine Corps for Lieutenant Colonels. The billets are divided into two categories, Operating Forces Commands (220 billets) and Supporting Establishments Commands (59 billets). The Operating Forces commands are with the Fleet Marine Force (FMF) units whereas the Supporting Establishments are all other commands. Examples of Supporting Establishments include Marine Security Guard Companies and Recruit Training Battalions. [Ref. 3]

The board is provided with the master personnel files of all officers eligible for selection. A Lieutenant Colonel is eligible if he has at least two years at his current assignment (or can be assigned a command at his current duty station), has not served in a command tour previously as a Lieutenant Colonel, has not requested in writing that he not be considered, and does not possess a voluntary or mandatory retirement date. The number of officers eligible for the board has decreased since the first board in Fiscal Year



(FY) 93 (see Figure 1), thus decreasing the population of Lieutenant Colonels considered for command. [Ref. 1]



**Figure 1. Number of Eligible Officers for the Command Screening Board, by Fiscal Year.**

The master personnel files are a microfilm record of the performance evaluations (fitness reports), commendatory material, and derogatory material in the official record of each officer. Inherent to each fitness report is an evaluation of the officer's performance for a reporting period of three to twelve months. An officer's entire fitness report history is summarized on a Master Brief Sheet. A member of the board will brief an individual officer's career to the remainder of the board. All of the board members then vote as to whether the officer should be selected to be a Commanding Officer or not. There is no absolute standard that officers are measured against to determine success or failure of selection by this board. Performance relative to the other officers being considered is the primary discriminator. [Ref. 2]

Lieutenant Colonels' command tour lengths are generally prescribed as 18-24 months in duration. However, Commanding Generals are free to make the final determination of how long an officer remains in the Commanding Officer billet. Emphasis is slanted toward longer (24 month) tours to enhance personnel stability and cohesion. Therefore, approximately 130 to 190 of the 279 Commanding Officer billets in the Marine Corps are vacated each year. In order to ensure the availability of enough officers for assignment, the Command Screening Board selects 200% of the number of officers required to fill the anticipated vacancies. [Ref. 1]

The board selects 200% of the required number because some of the officers selected may currently be filling a critical joint billet, acquisition billet, or some other billet

with unanticipated restrictions. The selection of 200% also provides alternates for officers who are initially offered command, but do not accept it. [Ref. 4]

Lieutenant Colonels selected by the board to command are considered "screened" (for command) and officers who are not selected to command by the board are considered "not screened" (for command). All of the Lieutenant Colonels that were eligible for the board are now considered in either the "screened" or "not screened" group.

In addition, the Command Screening Board produces two other reports. The first report is a listing of whether an officer is selected for an Operating Forces Command or a Supporting Establishments Command. A "screened" officer is notified by telephone, and by mail, of his status on this first report. The second report is a "ranking" of officers successfully "screened." This is a private report in which all of the "screened" officers are ranked as to whether their performance puts them into the top third, middle third, or bottom third of their peers on the "screened" list. Within each of the three groups, there is no determination of rank order. This report is not published to the Marine Corps, or even reported to those officers "screened." This private report is for the use of the officer assignment officers (monitors) who ensure that vacancies in all Commanding Officer billets are filled without a time gap between commanders. The monitors are responsible for assigning an officer to a specific billet at the appropriate date. [Ref. 4]

In the next step of the Command Screening Process, the monitors notify and congratulate all of the "screened" officers on the list from the board. At this time, they solicit the "screened" officers' desires as to duty station preferences and specific battalion, squadron, or supporting establishment preferences, as appropriate. Once this input is received for the entire "screened" list, the monitor will examine the Commanding Officer billets being vacated and match them up, as much as possible, with the "screened" officers' preferences. All of the officers in the top third, and about half of the officers in the second third, will be assigned to specific command billets, even if their specific duty station location and specific command preference can not be met. The officers in the top third of the private list are more likely to get their preferences than the middle third. This procedure is referred to as the slating process. Once this matching exercise is completed and approved at the HQMC level, an "initial slate" is published to inform the entire Marine Corps. [Ref. 4]

At this point, all of the Lieutenant Colonels that were eligible for the Command Screening Board can be placed into one of three groups. Recall that prior to the slating process all eligible officers belong to either the "screened" or "not screened" category.

Now the "screened" group is further broken down into the "screen, not slated" and the "screened and slated" (or just "slated," the "screened" status is implied) category.

All of the Lieutenant Colonels in the Marine Corps can now be categorized into one of the three above groups, or the "not eligible" group because of the Command Screening Process. Figure 2 illustrates the progression of the process. The bold print shows the path that must be traversed by a Lieutenant Colonel to become a Commanding Officer.

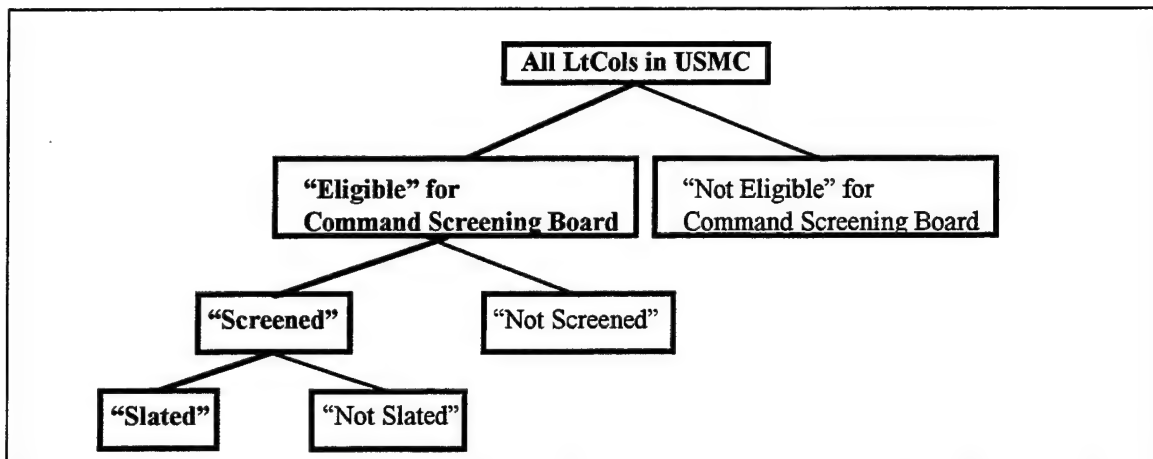
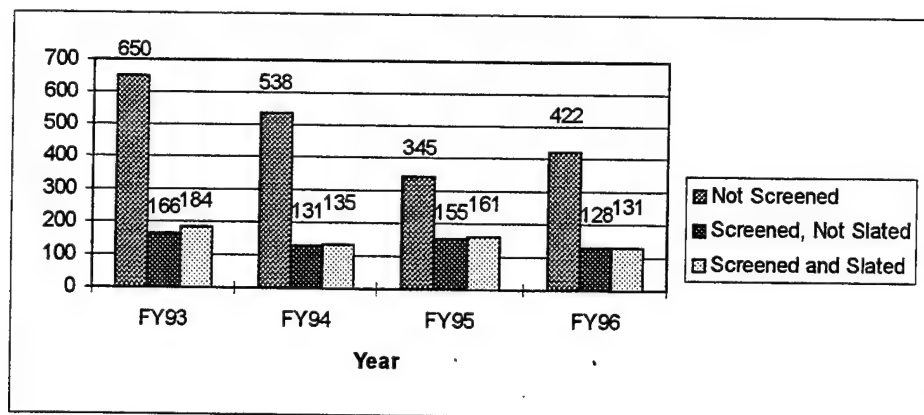


Figure 2. Categorization of Lieutenant Colonels as a Result of the Command Screening Process.

All "slated" officers must respond to the monitor, in writing, as to whether they accept or decline their command assignment [Ref. 4]. Some successfully "slated" officers decline the command and may even decide to retire instead of accepting the command at this point in the process. One reason an officer may decline is that he strongly desired an operational command, but he was offered a supporting command. Rather than settle for the supporting command, he requests retirement.

When all of the responses are back to the monitor, the slating process is conducted once again [Ref. 4]. At this time, it is feasible that even some of the officers in the bottom third of the private list may be offered commands. Keep in mind that although they are in the bottom third of the "screened" group, they are still a part of the best and most qualified of eligible Lieutenant Colonels. Through sufficient contact with the officers being offered command, the monitors know who will and who will not accept orders to command. At this time, the "modified slate" is published and considered a final document. Also, this is the final determination of whether an officer is "screened, not slated" or

“slated.” An officer could be switched among the two groups in the time between the initial slate and the revised slate. The number of officers within each of the three groups is shown in Figure 3 for the years FY93 through FY96.



**Figure 3. Results of Command Screening Program Slating Process, by Fiscal Year.**

There is another way to look at the results of the Command Screening Board and the subsequent slating process. Lieutenant Colonels who are “slated” get Commanding Officer billets, and officers that are in the “not screened” and “screened, not slated” groups do not get Commanding Officer billets. When the results of the Command Screening Process are viewed in this fashion, as shown in Table 1, one can see the relatively small percentage of eligible officers who actually receive command.

Year	Not Command	Command	% that Command
FY93	816	184	18.40
FY94	669	135	16.79
FY95	500	161	24.36
FY96	550	131	19.24

**Table 1. Percentage of Eligible officers that Command.**

It is important to note that the Command Screening Program is still in its early stage and suggestions for improvement are continuously being developed. For example, during the annual General Officer Symposium held in 1995, the Generals suggested to the Commandant of the Marine Corps that the results of the board, listing the “screened”

officers of those who were eligible for the board, not be released in a message to the entire Marine Corps [Ref. 5]. The perception was that a Lieutenant Colonel was labeled as one with a successful future if his name was on the "screened" list, as opposed to one whose name was not on the list (one who was a "not screened" officer) [Ref. 6]. If both officers worked for the same Colonel or General at the time the list was published, the impression was that the "screened" officer received preferential treatment in regard to duties, responsibilities, and ranking in fitness reports. This seemed justifiable because HQMC had already stated, by publication of the list, that the "screened" officer was more qualified for command than was the "not screened" officer. [Ref. 7]

The list was not published for the FY97 results. The officers eligible for the board were personally notified of their status through other means. However, what the Marine Corps discovered was that the word of who was "screened" and who was "not screened" became common knowledge via word of mouth anyway. Therefore, it was decided that the selection board list will once again be published for the FY98 results. [Ref. 8]

### C. PROBLEM STATEMENT

As previously stated, the purpose of this analysis is to determine whether the Command Screening Program is a "better" system of selecting battalion and squadron commanders than the previous method of letting the commanding generals choose their Commanding Officers from the officers assigned to their commands.

The officers in the data set were partitioned into four populations (or groups), based on their characterization at the rank of Lieutenant Colonel.

- **Pre-CSB CO** (Pre-Command Screening Board, Commanding Officer): This group consists of officers who held Commanding Officer billets under the prior method of selection. The Command Screening Process did not affect their careers.
- **Pre-CSB Not CO** (Pre-Command Screening Board, Not a Commanding Officer): This group never held the billet of Commanding Officer. The Command Screening Process did not affect their careers.
- **Post-CSB CO** (Post-Command Screening Board, Commanding Officer): This group was placed in the billet of Commanding Officer by the selection of the Command Screening Process.

- ***Post-CSB Not CO*** (Post-Command Screening Board, Not a Commanding Officer): This group has not held the billet of Commanding Officer, although affected by the Command Screening Process.

To analyze the effects of the Command Screening Board from a statistical standpoint, MOEs must be selected and computed for each of the four groups. The selection of the MOEs must be based on information (data) available for the analysis. There are numerous opinions about the Command Screening Process throughout the senior officer ranks, generally in favor of the process. However, these opinions can not easily be measured and structured for a statistical analysis.

The first MOE analyzed was related to the duration of time served in each Commanding Officer billet as a Lieutenant Colonel, namely the mean duration of a command tour. Approximately six percent of the *Pre-CSB CO* group had two or more Commanding Officer tours and consequently a longer command duration per officer on average than the *Post-CSB CO* group. When the data is partitioned into the length of each tour, it can be determined if a unit is receiving consistency of command. Therefore, the mean duration of a command tour is of interest to the Marine Corps. This analysis will determine if the mean tour duration of a Commanding Officer has increased, decreased, or remained the same since the introduction of the Command Screening Board.

The second MOE determines if there had been more or fewer officers "relieved from command" since the Command Screening Board went into effect. A Commanding Officer who has been relieved from command has failed to complete his assigned tour length of 18 to 24 months, usually for some negative reason about his performance. Because there is no actual record kept on the number of relieved Commanding Officers [Ref. 9], an assumption was made that if an officer had less than some "x" number of months as a Commanding Officer then he must have been relieved for cause. Although the data used for this analysis was not totally reliable in determining this categorization, the results do include some answers (with cautious reservation) on this facet.

The third MOE used to analyze the populations was the proportion of officers from the group who were promoted to the rank of Colonel. Furthermore, within each group, a comparison was conducted on the proportions of officers promoted below, within, or above the primary promotion zone for that officer's year group, given that they were promoted to Colonel.

The fourth MOE measured the groups' proportion of officers retiring prior to entering the primary zone for consideration to the rank of Colonel. In some cases, this MOE provided some interesting results when analyzed together with the fifth MOE. The fifth MOE measures the proportion of the group that retired (as Lieutenant Colonels) after they had been in the primary zone for consideration to the rank of Colonel. An assumption is made that the officers included in the data for the fourth MOE retired due to impending or actual "time in service" limitations. When these two MOEs are viewed together, for the same population, one can observe the propensity of the group to retire voluntarily vice waiting (often in vain) to be selected for Colonel by the selection board.

A sixth MOE measures the proportion of Commanding Officers retiring immediately at the end of their Commanding Officer tour.

The seventh MOE measures the proportion of officers who held Commanding Officer billets at the rank of Colonel, given that they were selected to the rank of Colonel.

#### **D. POPULATIONS FOR ANALYSIS**

Data was obtained on all officers who were Lieutenant Colonels in the Marine Corps as of September 1, 1988 through September 1, 1992 and all officers who were eligible (as explained in Section B) for one or more of the Lieutenant Colonel Command Screening Boards from FY93 through FY96. The career data on the officers included all that was available as of December 1996. The *Pre-CSB CO* group consists of Lieutenant Colonels who began their tours in Commanding Officer billets prior to June 1, 1993. The *Post-CSB CO* group are commanders who began their tours after (and including) this date. If an officer, who had never held a Commanding Officer billet, retired or was promoted to Colonel prior to June 1, 1993 then he was placed in the *Pre-CSB Not CO* group.

The composition of the *Post-CSB Not CO* group is perhaps the hardest to understand. Over 71 percent of the officers in this category were "eligible" for at least one of the Command Screening Boards held from FY93 to FY96 (so their status was either "not screened," or "screened, not slated"). It is reasonable to suspect that a large portion of the remainder of the officers were eligible for the FY97 board, but it is not possible to verify this suspicion because the FY97 Command Screening Board results were not published. A very small portion of the officers in this group were ineligible for any of the Command Screening Boards, due to being in one of the ineligible categories

mentioned in Section B. Officers in this small group were either promoted or retired prior to becoming eligible for a Command Screening Board. The number of officers in each of the four groups is given in Appendix A.



## II. DATA

### A. DATABASE DESCRIPTION

The data base consists of a portion of the official military records on all of the officers selected for the analysis as presented in Chapter I, Section D. Duplicated data was eliminated so that the information for each officer was in the data base only once. This resulted in the possession of 3417 officer's records.

The primary source of data was the Zip Master Brief Sheet for each of the above selected officers. These were obtained from Performance Evaluation Branch, HQMC. The Zip Master Brief Sheets are similar to the document used by the members of the board for the Command Screening Process. The only difference is that the Zip Master Brief Sheets do not include any performance markings. Recall that Master Brief Sheets contain a listing of an officer's entire fitness report history.

The Zip Master Brief Sheets were extracted from the data base in December 1996. Therefore, the information on a given officer is current as of his most recent fitness report that was submitted and entered into the data base prior to this date. The fitness report information was vital to the analysis in that it provided dates of career highlights that were necessary to determine the data for the MOEs used in the analysis.

There are several important fields within the fitness reports that were used for career analysis. The fields are defined in the Marine Corps Order concerning the Performance Evaluation System [Ref. 10]. Each definition is followed by an example of the field.

- Monitored Command:** The descriptive title and location of the unit to which the officer was assigned (for example, "5th Battalion, 11th Marines").
- Organization:** The organization, within the Monitored Command above, to which the officer was assigned (for example, "Headquarters Battery, Artillery Battalion").
- Duty Assignment:** The billet to which the officer was assigned for the reporting period (for example, "Battalion Commander").
- Grade:** The rank of the officer during the reporting period (for example, Lieutenant Colonel denoted by "LTCOL").

- Begin date and End date:** The dates the reported performance occurred, given in year, month, and day format (for example, "930529 to 940421" indicates the period from May 29, 1993 to April 21, 1994).
- Months:** The number of months included from the "begin date" to the "end date," rounded to the nearest month (for example, "11" for the above example "begin date" and "end date").
- Occasion:** A code indicating the reason the report was submitted (for example, "AN" indicates the fitness report was an annually required report).

The example in the definitions depicts a member of the *Pre-CSB CO* category. The example officer held a legitimate Lieutenant Colonel Commanding Officer billet as an Artillery Battalion Commander. He was serving in his command billet prior to June 1, 1993 so he was not selected for the Commanding Officer billet by the Command Screening Process.

The "begin date" of an officer's first fitness report, along with his "grade" (rank) at that time, was used as an initialization point for computing the officer's time in service and to determine if the officer entered the Marine Corps as a Second Lieutenant. This was used for analysis requiring retirement information. The "begin date" of his first report as Lieutenant Colonel was also important. This date determined when he was in the primary promotion zone for promotion to Colonel. The "end date" of his final report, perhaps noting his retirement, was also an important field for this analysis. In the method used to extract pertinent data from the data base, each Lieutenant Colonel's total time spent in a Commanding Officer billet was determined by addition of the number of months found in each of the "months" fields on fitness reports that were noted as being a legitimate Commanding Officer billet. This portion of the data was partitioned into the duration of each command tour, when that specific MOE was being analyzed.

Three of the most important fields of the fitness report are the "duty assignment," "monitored command," and "organization." These fields were the basis for determination if an officer was in a true Commanding Officer billet during that particular reporting period. There are numerous entries within the duty assignment field that can depict a Commanding Officer tour. An inspection of the "monitored command" and "organization" to which he belonged, helped clarify if the report should be flagged as an actual Commanding Officer tour or not. Also some billet descriptions indicate

"Commanding Officer," when a closer look at the "monitored command" and "organization" fields show that the officer was actually only a detachment commander. A detachment commander, not possessing the promotion, retention, and disciplinary authority of a Commanding Officer, was not counted as a Commanding Officer for the purpose of this analysis.

The "occasion" of the report was an important field, because an "EN" code in the "occasion" field of a fitness report denotes an "end of active service" fitness report. This is an officer's final report as a Marine and therefore provided the flag for an officer's retirement. Numerous officers did not possess this code in the "occasion" block, but they also did not have a fitness report on record for the previous 18 months (or longer). An annual (code "AN") fitness report is due every twelve months on all Marine Corps officers, which means that at a minimum every officer should have at least one fitness report on record for the previous twelve month period. There are usually reports more frequently than twelve months due to the numerous "occasions" that require a report be submitted. Therefore, an assumption was made that if an officer did not have a fitness report on record since 1994, a liberal 23 months to provide a grace period for possible administrative oversight, then he was considered to be retired. If the last fitness report on the officer's Zip Master Brief Sheet was not already an "EN" report, then a manual change was made to the data base used for this analysis, to consider it as an "EN" report, thus signaling a retired officer.

## **B. VALIDITY OF THE DATABASE**

The Zip Master Brief Sheets provide the best source of data for an analysis of this type. There are no other data bases, maintained in digital format, that offer such clarification on Commanding Officer billet assignments. The only way to unravel the true Commanding Officer population is to tediously inspect each fitness report's "duty assignment," "monitored command," and "organization" fields.

Unfortunately the Zip Master Brief Sheet entries are only as accurate as the fitness reports that are written on the officer. This has opened an opportunity for administrative errors that hinder an analysis of this type. For example, a Commanding Officer report stating that it covers a 99 month reporting period, when it actually covers only nine months, would skew the MOE of "command tour duration." As noted in the preceding

section, another common administrative mistake occurred in the "occasion" field of the officer's final fitness report. It was often not marked as an "EN," end of active service, report.

The actual Commanding Officer billets were relatively easy to determine for dates after the Command Screening Board was instituted, because the billets are outlined in a Marine Corps Order [Ref. 3]. For the questionable Commanding Officer tours before the Command Screening Board, a determination was made on their legitimacy based on the same Marine Corps Order. The order provided a good basis for a judgment call, if not an obvious decision, even though the order was not in effect at the time. A flag character was inserted into the data base to facilitate later extraction, by computer routines, of pertinent data. The final flagging determination of Commanding Officer billets was not taken lightly. The determination was conducted repeatedly, when organizing the data for analysis, checking and double checking for correctness at any sign of question.

Furthermore, the fitness report history lacks complete official information. For example, in this analysis an officer was considered to have been promoted to the rank of Colonel on the beginning date of his first Colonel fitness report. Perhaps this officer was "frocked," which means that he was allowed to wear the rank insignia of the next higher rank prior to his official promotion date. This sometimes occurs because the officer was filling a Colonel billet while he was still at the rank of Lieutenant Colonel. If he was given a fitness report at the time of frocking, then he is considered to have been promoted to Colonel prior to his year group being in the primary zone for consideration, for the purpose of this analysis.

### III. METHODOLOGY

#### A. ASSUMPTIONS

The discussion so far has already presented some of the assumptions necessary to properly conduct this analysis. Other assumptions, as well as those previously mentioned, are presented here for consolidation.

Manual corrections were made to the data base when administrative errors were found on fitness reports. Potential discrepancy reports were generated in the computer programs that processed the data. Suspect entries were researched thoroughly, and corrective action was taken when necessary. It is assumed that if there are any errors that effect the fields used to determine MOEs, they are consistent errors throughout all four populations and insignificant.

If an officer had not received a fitness report since 1994, he was considered to be retired. The data base was recovered from the Performance Evaluation Branch, HQMC files in December 1996. All fitness reports received and entered into the data base by that time are included in this analysis. If the last fitness report on record for an officer was in 1994 or prior, it was assumed that the officer was retired. The last fitness report "occasion" field was manually changed to an "end of active service" (code "EN") report, if it was not already coded as such, which flagged the retirement of the officer.

On occasion, there was a challenge in determining if a fitness report with a "begin date" prior to June 1, 1993 (*Pre-CSB*) qualified to be considered as a legitimate Commanding Officer fitness report. An inspection of the "duty assignment," "monitored command," and "organization" was usually enough to clarify the report and make a determination if the report should be credited as being a Commanding Officer report. In cases that were still questionable, it was assumed that the current Marine Corps Order addressing the Commanding Officer billets that the Command Screening Process uses for billet validation [Ref. 3] was a reliable document to verify if that billet was a Commanding Officer billet, even during the period prior to the existence of the Command Screening Process.

Within the *Post-CSB Not CO* group, there may have been a few officers who were ineligible for any of the Command Screening Boards because of one of the reasons previously mentioned in Chapter I. It is highly suspected, though, that the majority of "unaccounted for Lieutenant Colonels" were considered for selection by the unpublished

FY97 board. Even if there were officers who were never eligible, they are still part of the group that was previously defined as one that was affected by the Command Screening Process. An assumption is made that since the board was in effect at the time of their retirement or promotion, the fact that there was now a Command Screening Process did influence their decision to retire or, in some cases, to wait for the opportunity to be promoted to Colonel.

The first Command Screening Board was held in FY93 for selection of Lieutenant Colonels to be slated for Commanding Officer billets being vacated after June 1, 1993. There was a nine month period where an officer, and the rest of the Marine Corps, had knowledge of the FY93 board results. Some of the "not screened" officers may have been given a chance at command, based on the judgment of their Regimental Commander or Commanding General. These officers were placed in the *Pre-CSB CO* group since their command assignment began prior to June 1, 1993. The assumption is made that there were no "change of plans" in regard to who was placed in Commanding Officer billets during this transition period.

If an officer was in a Commanding Officer billet, but failed to command more than seven months, he was considered to be "relieved from command" for the purposes of this analysis. Caution was taken to ensure that this small number of officers were serving in billets with all of the promotion, retention, and disciplinary authority of true Commanding Officers. Close inspection of the data showed that all of these officers were placed in duty assignments of relatively little significance for the remainder of their careers, after their short Commanding Officer tour, and then retired when they were eligible (20 years). This category was approached with reservation, because the determination of a "relatively insignificant duty assignment" is based on the judgment of the author. There were other officers who completed longer and regular duration tours (8-24 months) who also went on to relatively insignificant duty assignments. Some of them may have been relieved from command also, but they were not considered as such for this analysis.

The "eligible" list for Colonel promotion boards was not available, therefore the "begin date" of an officer's first Lieutenant Colonel report determined the year for which he was in the primary zone for consideration of promotion to the rank of Colonel. The "fitness report determined eligible date," and the date that each year's Colonel Promotion List started promoting and finished promoting (cleared), was compared to an officer's first Colonel fitness report "begin date." The Colonel's Promotion Lists information, for each year, was obtained from HQMC, Officer Promotion Branch (Code MMPR1). A

comparison of the dates was made to determine whether an officer was promoted early, on time, or late.

If an officer was promoted before the primary zone for his year group he was considered an early (prior to his peers) promotion. It is assumed that he was selected in the previous year when he was below the primary zone for consideration, but he may have also been frocked as defined in Section B of Chapter II. There is no reason to believe that frocking took place in any one of the four groups used for comparison more than in the other three groups, so the frocking assumption will not skew the data. If an officer was promoted at the same time as the officers in the primary zone for his year group, then he is considered an on time (with his peers) promotion. If an officer was promoted one year or more after the officers in the primary zone for his year group had all been promoted, he is considered a late (after his peers) promotion. If an officer was in the Marine Corps long enough to be considered for promotion to the rank of Colonel, but did not get promoted, then an assumption was made that he had been "passed over" for promotion and given a mandatory retirement date due to time in service limitations.

The only variable analyzed in this thesis is the institution of the Command Screening Process. If there were confounding variables that have affected the proportions for the MOEs, they affected them consistently throughout the analysis. An example of a confounding variable would be if the promotion opportunity to the rank of Colonel had been increased from 50% to 60% after June 1, 1993 as a matter of policy. This would allow a greater proportion of the Post-CSB groups to be promoted and hence would increase the probability of the Post-CSB group's proportions being greater than the Pre-CSB group's proportions in the promotion MOE.

## **B. STATISTICAL PROCEDURES**

A "P value" will be given for the results of all statistical tests, instead of choosing any level of significance. The "P value" is the smallest level of significance for which the null hypothesis could be rejected. If the "P value" is small (close to zero, less than the desired level of significance for the reader) then the null hypothesis is most likely not true, so "rejecting" the null hypothesis is valid. The larger the "P value," the more sure one can be that the null hypothesis is true, so "not rejecting" the null hypothesis is valid. For the reader not comfortable with "P values," a level of significance of 0.01 is not unreasonable

due to the high number of tests conducted on the data. This would mean that 1 time out of 100, one would incorrectly reject the null hypothesis when the null hypothesis is true. [Ref. 11]

In general, four types of comparisons (of two groups each) are made on the applicable MOEs. Other permutations of the groups would not provide results of any interest or analysis value. The four main comparisons are noted below.

- *Pre-CSB CO and Pre-CSB Not CO*
- *Post-CSB CO and Post-CSB Not CO*
- *Pre-CSB CO and Post-CSB CO*
- *Pre-CSB Not CO and Post-CSB Not CO*

The first two comparisons will show if there is an advantage for officers who have commanded over officers who have not, and if that advantage has changed since the institution of the Command Screening Board. The last two comparisons will show if there have been any trends established, that differentiate the "*Pre*" and "*Post*" Command Screening Board era.

When conducting this type of analysis, it is useful to postulate, prior to knowing the results, what the results should show if the Command Screening Process is in fact more effective than the prior method of selecting Lieutenant Colonel Commanding Officers. These postulations are presented in the subsections below.

#### **1. Duration of Commanding Officer Tours**

This section looks at the mean length of time that a Lieutenant Colonel spends in each Commanding Officer billet, also referred to as command tour duration. A computer program extracted the duration of command time for each of the officers in the *Pre-CSB CO* and *Post-CSB CO* groups from the data base to use for comparison.

This portion of the analysis will not determine if the Command Screening Process is more effective, it is only a check to see if the Marines are getting better or worse turnover of Commanding Officers in their units. If the mean command tour duration is the same, then the same consistency of command has been maintained. If the mean command



tour duration has increased (decreased), then the Command Screening Process has improved (hindered) the consistency of command.

The Command Screening Process insures that Lieutenant Colonels receive only one Commanding Officer tour. An officer is ineligible for future boards once he is slated, therefore as many officers as possible receive an opportunity to command. This is one of the basic tenets of the Command Screening Program.

Under the previous method of selection an officer could serve in multiple Commanding Officer billets, as the Commanding General made the decision. The data reveals that approximately six percent of the *Pre-CSB CO* group commanded in two, or more, different commands. The length (duration in months) of each individual command tour was extracted from the data base for officers with multiple commands.

The Marine Corps order on the Command Screening Program states that "Continuity and consistency of command are paramount for stability in our units" [Ref. 1]. This seems to contradict the desire to give more Lieutenant Colonels a chance to command. A balance between the two desires is reached in directing that tour lengths will generally be 18-24 months in duration for Commanding Officers selected by the Command Screening Process.

Only command durations of Commanding Officers who completed their command tour was used in this portion of the analysis. Many members of the *Post-CSB CO* group are still serving in their commander tours, whereas many of the officers in the *Pre-CSB CO* group completed more than one Commanding Officer tour, as shown in Table 2.

<u>Category</u>	<u>Number in Category</u>	<u>Number of Completed Command Tours</u>
<b>Pre-CSB CO</b>	1430	1514
<b>Post-CSB CO</b>	481	269

**Table 2. Number of Completed Command Tours, by Group.**

By using only completed command tours, "length bias sampling" is introduced into this part of the analysis. By December 1996, when this data was drawn from the HQMC data base, the Command Screening Process had been in effect for 44 months. All that is known about the 212 command tours not used in this part of the analysis is that they were not completed as of December 1996. This type of sampling is more likely to eliminate command tours of longer duration, since longer tours are more likely to be continuing past

the date the data was withdrawn and therefore not part of the 269 command tours used in this portion of the analysis.

The Kolmogorov-Smirnov Goodness-of-Fit test was the first test used on this data. This tests the relationship between two distributions. Tests were conducted to determine if either set of data fit the Normal distribution, and to see if the two data sets' distributions fit each other. The null hypothesis is that the two distribution functions are equal. [Ref. 12]

A two-Sample, one-sided  $t$  test was used to determine if the mean of the two distributions was the same or if the mean of one distribution was "greater" than the other. Even if the Goodness-of-Fit test above shows the data does not fit the Normal distribution, the  $t$  test is robust with respect to departures from normality [Ref. 11]. Under the null hypothesis, the two means differ by a predetermined value. If this value is set to zero, then the test is to check if the mean of one is greater than the mean of the other. [Ref. 12]

The next assessment to conduct with this sample of the data, was to check if the mean duration of command tours was actually at 18-24 months, as HQMC desires. The  $t$  test mentioned above, is only used to compare the point estimates of the two means. In this part of the analysis, confidence interval estimation is used to indicate the precision on the point estimate of the mean command tour duration [Ref. 11].

The final use of the command tour duration data was to compare the *Pre-CSB CO* group with the *Post-CSB CO* group in their number of relief's from command, which is used as an indication of "failures." For the purpose of this analysis, a command duration of less than eight months was considered a failure. The methods used to compare these populations were proportion tests. Proportion tests are statistical tests to see if two probabilities are the same. The Pearson's Chi-Squared statistic is used, which estimates the common probability of occurrence as the total number of observed occurrences divided by the total number of trials. [Ref. 13] If the Command Screening Board is choosing more effective Commanding Officers, then the *Post-CSB CO* group should have a lower proportion of failures than the *Pre-CSB CO* group.

## **2. Promoted to Colonel, Retired, or Passed Over**

This section examines the four pairwise group comparisons in regard to the groups' overall promotion percentage to Colonel, retirement as a Lieutenant Colonel prior to being in the primary zone for consideration to the rank of Colonel, and retirement as a

Lieutenant Colonel after being in the primary zone for consideration to the rank of Colonel (Passed Over). Statistically, the proportion tests on this data were conducted in the same manner as mentioned in the above subsection. Although independence does not exist within a specific group, there is independence between two different groups and thus the proportion test is still valid.

If the Command Screening Process is choosing more effective Commanding Officers, then the analysis should show the results that follow. These postulations are also based on the premise that the selection of a more effective CO is analogous to selection of an officer who is more determined to spend a longer career in the Marine Corps.

- ***Pre-CSB CO vs. Pre-CSB Not CO, Post-CSB CO vs. Post-CSB Not CO:*** CO groups should have a higher promotion proportion to Colonel, a lower retirement proportion, and a lower passed over proportion. This should be true for both the "Pre" and "Post" comparisons.

- ***Pre-CSB CO vs. Post-CSB CO:*** "Post" group should have a higher promotion proportion to Colonel, a lower retirement proportion, and a lower passed over proportion.

- ***Pre-CSB Not CO vs. Post-CSB Not CO:*** This comparison, by logic, should show the opposite of the results obtained by the Commanding Officer comparison above. Therefore, the "Post" group should have a lower promotion proportion to Colonel, a higher retirement proportion, and a higher passed over proportion.

### **3. Promoted to Colonel Before, Within, or After Primary Promotion Zone**

This section looks at the four main comparison groups in regard to each group's relative time of promotion to Colonel, given that they were promoted to Colonel. Only those officers who were promoted are included in the numbers used for the proportion tests of this section. Statistically, the proportion tests on this data were conducted in the same manner as previously mentioned.

If the Command Screening Process is choosing more effective Commanding Officers then the analysis should show the following listed results.

- ***Pre-CSB CO vs. Pre-CSB Not CO, Post-CSB CO vs. Post-CSB Not CO:*** CO groups should have a higher "early" (before primary promotion zone) promotion

proportion, a higher "on time" (within primary promotion zone) proportion, and a lower "late" (after primary promotion zone) proportion. This should be true for both the "Pre" and "Post" comparisons.

- **Pre-CSB CO vs. Post-CSB CO:** "Post" group should have a higher "early" promotion proportion, a higher "on time" proportion, and a lower "late" proportion.

- **Pre-CSB Not CO vs. Post-CSB Not CO:** "Post" group should have a lower "early" promotion proportion to Colonel, a lower "on time" proportion, and a higher "late" proportion.

#### **4. Commanding Officer as a Colonel**

This section examines the four main comparison groups in regard to each group's proportion of officers who held Colonel Commanding Officer billets, given that they were promoted to Colonel. The length of time served as a Colonel was not determined. Proportion tests were once again the method applied to the data.

If the Command Screening Process is choosing more effective Commanding Officers then the analysis should show the following listed results.

- **Pre-CSB CO vs. Pre-CSB Not CO, Post-CSB CO vs. Post-CSB Not CO:** CO groups should have a higher proportion of Colonel Commanding Officers. This should be true for both the "Pre" and "Post" comparisons.

- **Pre-CSB CO vs. Post-CSB CO:** "Post" group should have a higher proportion of Colonel Commanding Officers.

- **Pre-CSB Not CO vs. Post-CSB Not CO:** "Post" group should have a lower proportion of Colonel Commanding Officers.

#### **5. Officers Retiring at the End of Their Commanding Officer Billet**

This section examines the propensity of an officer to retire, with his last billet being that of a Commanding Officer. It does not take into account the number of years of service an officer had at that time in his career. The postulations are further based on the premise that the selection of a more effective Commanding Officer is also analogous to selection of an officer who is more determined to spend a longer career in the Marine Corps. Proportion tests are used for this comparison as in previous ones.

There are two chances for an officer to be a Commanding Officer in this analysis, either at the rank of Lieutenant Colonel or Colonel. If the Command Screening Process is choosing more effective Lieutenant Colonel Commanding Officers, then this comparison should show the following listed result.

- Pre-CSB CO vs. Post-CSB CO:*** "*Post*" group should have a lower retirement proportion.

For Commanding Officers at the rank of Colonel, the proportions should show the following listed results.

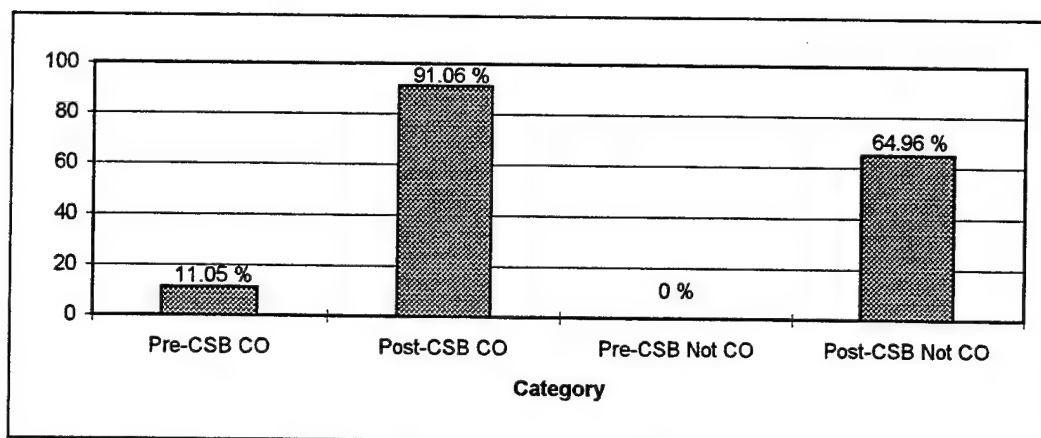
- Pre-CSB CO vs. Pre-CSB Not CO, Post-CSB CO vs. Post-CSB Not CO:*** *CO* groups should have a lower retirement proportion. This should be true for both the "*Pre*" and "*Post*" comparisons.
- Pre-CSB CO vs. Post-CSB CO:*** "*Post*" group should have a lower retirement proportion.
- Pre-CSB Not CO vs. Post-CSB Not CO:*** "*Post*" group should have a higher retirement proportion.

### C. LIMITATIONS

The current analysis provides the methodology toward a fair judgment of the Command Screening Process' success to date, but the results are often inconclusive. Such an analysis will be much more decisive when, and if, it is repeated at some future time. Presently, the careers of the officers affected by the Command Screening Process need more time to "mature." This has already been observed when viewing the number of Commanding Officers who have finished their command tour, displayed in Table 2 of Section B. The fact that so many of the *Post-CSB CO* group are still in command eliminated a lot of potential data when comparing the MOE concerning the duration of command tours.

Also, a large percentage of the Lieutenant Colonels affected by the Command Screening Process have not yet reached the primary promotion zone for selection to the

rank of Colonel, as shown in Figure 4. Promotion, retirement, and passed over proportions are, and will be in the future, a major yardstick to prove or disprove the effectiveness of the Command Screening Process. This analysis is forced into using data that has not yet reached its "steady state" to fairly compare these MOEs. Therefore, the results may often be premature. Still, the methodology as outlined in this study should be a valid one.



**Figure 4. Percentage of Officers Not Yet in Primary Promotion Zone for Colonel, as of December 1996.**

In reference to Figure 4, showing the percentage of officers that do not yet have sufficient time to be in the primary promotion zone for the Colonel promotion board, the *Pre-CSB CO* group has an eleven percent posting, even though it seems that enough time has passed that this value should be zero. This is explained by recalling that a member of the *Pre-CSB CO* group may have begun his Commanding Officer tour as late as May 31, 1993, so it is reasonable that eleven percent have not yet reached enough time in rank as a Lieutenant Colonel to be in the primary zone for the Colonel Promotion Board. The *Pre-CSB Not CO* category shows a zero percent posting because all of the officers were either retired, or promoted to Colonel prior to June 1, 1993. This is the way the group was defined, as discussed in Chapter I, Section D.

In Figure 4, the *Post-CSB Not CO* category has a lower percentage than does the *Post-CSB CO* group because the *Post-CSB CO* group consists of a younger population (meaning less time in service). The FY93 Command Screening Board included all officers who had not yet held Commanding Officer billets as Lieutenant Colonels, regardless of seniority (meaning time in rank). If a Lieutenant Colonel was relatively senior and did not

already have a command, then the Command Screening Board recognized what the appropriate Commanding General choosing Commanding Officers at the time recognized, that the officer was probably not Commanding Officer material. Subsequently, this group of senior Lieutenant Colonels rated being placed in the *Post-CSB Not CO* category. Because the *Post-CSB Not CO* population is more senior, in general, they have enough time in service to have been considered by a Colonel promotion board, at least more so than the *Post-CSB CO* population.

If the FY93 Command Screening Process results had not been included in the data base for this analysis, there would have been even fewer officers with enough time in rank as Lieutenant Colonel to have reached the primary zone for selection to the rank of Colonel. Future studies of the Command Screening Process may have the "luxury" of eliminating the FY93 Command Screening Board data from the data set, if the remainder of the officers have enough time in service to gather the necessary "career highlight" data.





## IV. RESULTS AND DISCUSSION

### A. DURATION OF A COMMANDING OFFICER TOUR

The first portion of the analysis examines the data to see if the average command tour is longer, shorter, or the same as the average command tour prior to the establishment of the Command Screening Process. A determination of the distribution of the command tour length data is needed in order to apply the correct test procedures to the comparison of the means.

The second part of this section establishes a confidence interval around the point estimate of the mean command tour duration. The Marine Corps desires an 18-24 month command tour duration, for consistency purposes. The creation of a confidence interval is the tool that will be used to provide a determination if that goal is being achieved.

The final portion of this section compares the number of relief's from command between the *Pre-CSB CO* and the *Post-CSB CO* groups.

#### 1. Distributions of Command Tour Durations

Histograms of the command tour length durations are given in Figure 5, for both the *Pre-CSB CO* and the *Post-CSB CO* groups.

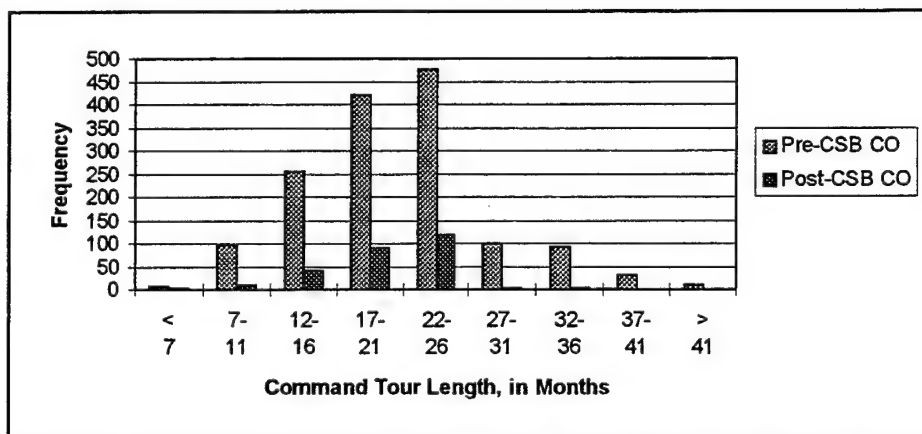


Figure 5. Time, in Months, of Lieutenant Colonel Commanding Officer Tours.

Besides illustrating that the *Pre-CSB CO* population has a much higher population size, the histograms show that the length of command tours for the *Post-CSB CO* group has

generally adhered to the Command Screening Program's guidance. Likewise, the command tour durations under the previous method of Commanding Officer selection were by and large 17 to 26 months. The data used to make the histogram can also be used to determine the distributions of the command tour durations for the *Pre-CSB CO* and *Post-CSB CO* groups. The distributions are of interest in order to judge what statistical process is necessary to compare the two means of the command tour lengths.

Kolmogorov-Smirnov Goodness-of-Fit tests were performed on the distributions of the *Pre-CSB CO* group and the *Post-CSB CO* group. Each was tested with the Normal distribution and then to each other. The "P value" for all three of the tests was zero. Therefore, the null hypothesis, that the two compared distributions are the same, as well as the normality of the distributions, was rejected in all cases. Several different transformations to the data were applied and tested, also with negative results on fitting a Normal distribution.

A comparison of the cumulative distribution functions of the *Pre-CSB CO* and the *Post-CSB CO* groups, as shown in Figure 6, helps to explain the results of the Goodness-of-Fit tests.

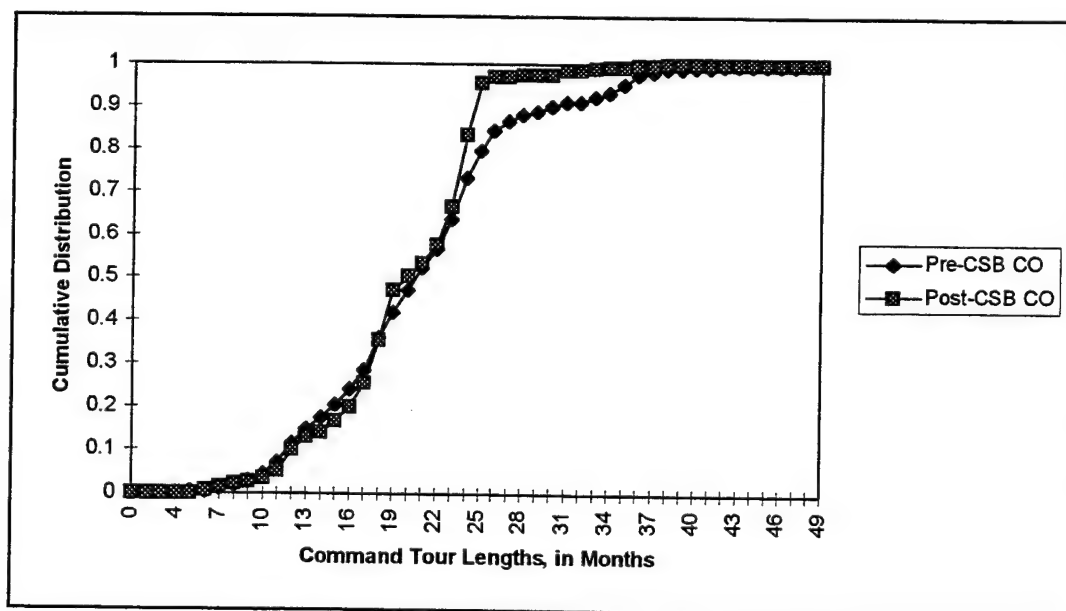


Figure 6. Cumulative Distribution Function of Duration of Command Tours.

The two distributions are approximately equal up to the 23 month point, after which they deviate from each other. This means that the probability of having a command tour of less

than or equal to any specific number of months less than (and including) 23 months is very close to being the same for officers who commanded before and after the Command Screening Process went into effect. The fact that the *Post-CSB CO* distribution line is steeper than the *Pre-CSB CO*'s after the 23 month point means that there is a greater probability for longer command tours for the *Pre-CSB CO* group. For example, the *Pre-CSB CO* group had a 21% chance of having a command tour longer than 25 months, whereas his *Post-CSB CO* group peer has only a 5% chance.

## 2. The Mean Durations of Command Time

The point estimate of the mean command tour duration and its corresponding standard deviation, in months, for each of the two populations is given in Table 3.

Category	Mean	Standard Deviation
Pre-CSB CO	21.24	7.03
Post-CSB CO	20.23	4.96

Table 3. Mean and Standard Deviation of Command Tour Durations, in Months.

The point estimate of the mean command tour duration for the *Pre-CSB CO* group is approximately one month greater than that of the *Post-CSB CO* group. There is also a much greater variability of the command tour lengths for the *Pre-CSB CO* group, as measured by the standard deviation.

Despite the failure of the data to fit a Normal distribution, a one-sided *t* test was utilized, appropriately due to its robustness, to compare the mean durations of command tours between the *Pre-CSB CO* and *Post-CSB CO* groups. The "P value" on this test was 0.0013, which indicates that the null hypothesis (the means are the same) can not be accepted as being valid. This would suggest that the Marine Corps has statistically decreased the mean duration of a command tour, and hence consistency of command, by instituting the Command Screening Program. However, as mentioned in Section B of Chapter III, length bias sampling had the effect of eliminating command tours of longer duration from this portion of the analysis, since only completed command tours were included in the proportions. Therefore, no decisive conclusion can be reached on whether command tour durations have, in fact, decreased or not.

### 3. Confidence Intervals

The next assessment of the duration of command tour data, was to determine if the Marine Corps is achieving its goal in reaching the desired 18-24 month command duration for the *Post-CSB CO* group. As a matter of interest, the *Pre-CSB CO* group command tour duration confidence interval is also included. Table 3 provided the mean point estimate for both populations. Table 4 shows the confidence intervals for some pre-specified levels of confidence.

Confidence Interval	Pre-CSB CO		Post-CSB CO	
	Minimum Mean Tour Duration	Maximum Mean Tour Duration	Minimum Mean Tour Duration	Maximum Mean Tour Duration
99%	20.77	21.72	19.45	21.01
95%	20.89	21.61	19.64	20.82
90%	20.95	21.55	19.73	20.73

Table 4. Confidence Intervals for Mean Command Tour Duration, in Months.

Therefore, one can be 99 percent confident that the true mean time of a Commanding Officer tour by Lieutenant Colonels (who did have a command tour) in the era of the Command Screening Process is between 19.45 and 21.01 months. Similarly, for the Commanding Officers selected under the previous method of selection, one can be 99 percent confident that the true mean time of a Commanding Officer tour was between 20.77 and 21.72 months. The conclusion is that the Marine Corps is successfully achieving its goal of reaching an 18-24 month length of command tour.

### 4. Relieved From Command

The final use of the duration of command tour data is for the comparison on the number of reliefs of command that have occurred since the institution of the Command Screening Process. The assumptions and reservations associated with this comparison were already discussed in Chapter III, Section A. The number of officers relieved from command (a command tour of less than eight months) from both categories were very small (see Appendix B). The proportions and the results of the proportion test are given in Table 5.

	Pre-CSB CO	Post-CSB CO	"P value"
Proportion Relieved From Command	0.0049	0.0149	<b>0.1451</b>

**Table 5. Comparison of Proportions of Officers Relieved from Command.**

The proportion in the *Post-CSB CO* group was higher, although not to a statistically significant degree, than the *Pre-CSB CO* group. This was an unexpected result from the postulation made in Chapter III. This may change as the number of completed command tours for the *Post-CSB CO* group increases, but the current data's trend is not supportive of the Command Screening Process. The result, as reflected by this MOE, suggests that the Command Screening Process is not choosing Commanding Officers as effectively as the previous method, at least as indicated by the data to date.

The issue of loyalty may be an explanation for these results. In the *Pre-CSB* era, a Commanding General had personal knowledge of the Lieutenant Colonel, along with his strengths and weaknesses, prior to placing the officer in a Commanding Officer billet. The Lieutenant Colonel knew that he was serving at the pleasure of the Commanding General and a "loyalty bond," both up and down the chain of command, existed. To relieve the Lieutenant Colonel would have meant the Commanding General's judgment was not well founded in assigning the officer as a commander, and the loyalty bond would have been broken. Based on the proportion for the *Pre-CSB CO* group, the bond was not often broken.

Conversely, in the *Post-CSB* era, a Commanding General must accept the Lieutenant Colonel commanders who are assigned to him from HQMC by way of the Command Screening Process. There is no personal basis for the loyalty bond that existed under the previous method of Commanding Officer selection. If the Lieutenant Colonel is relieved, this is not a reflection of the Commanding General's lack of judgment to place the officer in that billet, only seemingly bad judgment of the HQMC level Command Screening Board to select that officer for command. Subsequently, more officers are relieved from command and the results are as indicated.

## **B. PROMOTED TO COLONEL, RETIRED, OR PASSED OVER**

Since being promoted, voluntarily retiring, or being passed over (given a mandatory retirement date) by the Colonel Promotion Board are the only three methods by which an officer can cease being a Lieutenant Colonel in the Marine Corps, these methods will sometimes be referred to as "terminal" events. The remainder of the officers of this rank are still serving, as Lieutenant Colonels, in the Marine Corps and are not included in this portion of the analysis when computing proportions for the four main groups introduced in Chapter I, Section C.

When reviewing this section, it is important to keep in mind the small population size of the *Post-CSB CO* group qualified to participate in this portion of the analysis. Thus far, only 42 officers in the group have been promoted, voluntarily retired, or passed over. For each of the proportions of the *Post-CSB CO* group represented in the subsections that follow, one officer accounts for a little more than two percent of the proportion. Nevertheless, results are determined based on the data as it stands. The proportions are comprised of the numbers presented in Appendix B.

Proportion tests were once again the tool used for pairwise comparisons among the groups, as presented in Section B of Chapter III. Instead of looking at the results of the tests separately for each terminal condition, a more comprehensive comparison is possible by looking at all three terminal conditions for each pairwise comparison. This allows determination of the propensity of a group to prefer one terminal condition to another, since for each group the sum of the three terminal condition's proportions will add to one.

In addition, the purpose of this analysis is to determine if the Command Screening Process results in selection of more successful, career oriented Commanding Officers than the previous method of selection. Postulations as to what the results should be, if the Command Screening Board method was in fact more effective, were made in Chapter III, Section B. The discussion following each set of test results will discuss whether the postulations were achieved.

### **1. Comparison of the CO and Not CO Groups Prior to the Command Screening Process**

The test results of the *Pre-CSB CO* and *Pre-CSB Not CO* comparison category are shown in Table 6.

Pre-CSB Groups	CO	Not CO	"P value"
Promoted	0.5000	0.2663	~ 0
Retired	0.2417	0.5547	~ 0
Passed Over	0.2583	0.1790	0.0001

**Table 6. Comparison of Passed Over, Retired, and Promoted Proportions of the Pre-CSB CO and Pre-CSB Not CO Groups.**

The results of the promotion comparison are as postulated, providing statistically significant proof that there is a relative advantage for officers who command. By percentage, almost twice as many commanders are promoted than Lieutenant Colonels who do not command. The retirement comparison was also as postulated meaning that an officer who commands is less likely to retire voluntarily. The two proportions in the retired comparison were not expected to differ by such a high degree, but were anticipated to be statistically significant in their differences. An explanation follows with the discussion of the passed over results.

The passed over proportions provided an unexpected result, inasmuch as more commanders are passed over than Lieutenant Colonels who did not command. The proportions are different enough to be statistically significant. This result may partially be explained by the high percentage of officers in the *Pre-CSB Not CO* group who voluntarily retired as opposed to the *Pre-CSB CO* group that chose retiring as their least likely terminal condition.

This left few remaining officers (44%) from the *Pre-CSB Not CO* group to be promoted or passed over (i.e., eligible for the Colonel promotion board), which are the only two terminal conditions remaining if an officer has not already voluntarily retired by this point. Contrarily, over 75% of the *Pre-CSB CO* group were eligible for the Colonel promotion board. Only 35% (Promoted / (Promoted + Passed Over)) of those from the *Pre-CSB Not CO* group that were eligible for the Colonel promotion board were promoted, whereas the *Pre-CSB CO* group enjoyed a promotion rate of 67%. Therefore, the Passed Over proportion of the *Pre-CSB Not CO* group is less than the Passed Over proportion of the *Pre-CSB CO* group, but the results still indicate that a higher proportion of those who commanded are promoted.

The question that begs to be answered is "Does the *Post-CSB Not CO* group have the same propensity to retire voluntarily vice waiting for the Colonel Selection Board, as

did those prior to the Command Screening Process?" Also "Does the *Post-CSB CO* group have the same propensity to wait for the Colonel Selection Board, usually with favorable results, as did those prior to the Command Screening Process?" These questions will be answered in the next analysis.

## 2. Comparison of the CO and Not CO Groups Under the Command Screening Process

Table 7 consolidates the "*Post*" comparison category of the passed over, retired and promoted proportions.

Post-CSB Groups	CO	Not CO	"P value"
Promoted	0.4524	0.2552	0.0133
Retired	0.3333	0.2828	0.6216
Passed Over	0.2143	0.4621	0.0042

**Table 7. Comparison of Passed Over, Retired, and Promoted Proportions of the Post-CSB CO and Post-CSB Not CO Groups.**

This comparison has two indicators that the Command Screening Board is choosing more successful commanders than the previous method of selection. The promotion proportions show that being a commander as a Lieutenant Colonel still remains an advantage over officers who did not command in the Colonel promotion board, although just barely in a statistically significant way. This is further reinforced by showing that a statistically significant higher proportion of *Not COs* are passed over than officers who did command.

The retired proportions show that the *CO* group is voluntarily retiring at a somewhat higher rate than the *Not CO* group. This implies that the Command Screening Process is not necessarily choosing Commanding Officers who are more likely to remain in the Marine Corps, only officers who will be the best commanders. The notion that a good commander means a more career oriented officer is not supported by this result.

The *Post-CSB Not CO* group displays a preference to wait for the Colonel promotion board instead of retiring voluntarily, mostly with unfavorable results. Similarly, the majority of the *Post-CSB CO* group awaits the Colonel promotion board, but unlike



the Lieutenant Colonels who do not command, a higher proportion of the Commanding Officers are promoted.

A look at the third and fourth pairwise comparisons will help identify how the *CO* and *Not CO* populations each compare between the *Pre* and *Post-CSB* groups.

### 3. Comparison of the CO Groups, Prior and Post Command Screening Process

The comparison of the *Pre* and *Post* Commanding Officer groups is shown in Table 8.

CO Groups	PRE	POST	"P value"
Promoted	0.5000	0.4524	0.6524
Retired	0.2417	0.3333	0.2391
Passed Over	0.2583	0.2143	0.6431

**Table 8. Comparison of Passed Over, Retired, and Promoted Proportions of the Pre-CSB CO and Post-CSB CO Groups.**

The passed over category comparison is the only result that meets the postulated requirements of the Command Screening Process being more successful than the previous method of selection for Commanding Officers. The proportions are favorable to the new method, but not to a statistically significant degree. Nevertheless, it is a positive outcome for the new selection process, that officers chosen by the board have a lower passed over rate than the officers selected by the previous method.

The promotion and retirement category comparisons show the Command Screening Process is failing to select more successful and career oriented Commanding Officers (although not to a statistically significant degree) than the previous method of selection. The relative proportion of officers promoted has decreased in the *Post-CSB CO* group, while a greater proportion has also voluntarily retired. One possible explanation is that there are few officers in the *Post-CSB CO* group who have enough time in service to be considered by the Colonel promotion board. Once the *Post-CSB CO* group gains more time in service, the trends of the promotion and retirement categories may fall in line with the postulated results.

The choice of Lieutenant Colonel terminating conditions between the Commanding Officer populations has not significantly changed between the *Pre* and *Post* Command Screening Process era. The *Post-CSB CO* group shows a 0.67 probability of awaiting the Colonel promotion board whereas their *Pre-CSB CO* group peers had a higher (0.75) probability.

Statistically, the above results imply that the Commanding Officers selected by the Command Screening Process are about as effective, but not more effective, than the Commanding Officers selected by the previous method.

#### 4. Comparison of the Non-CO Groups, Prior and Post Command Screening Process

The same trend comparison with the two groups of Lieutenant Colonels who were not Commanding Officers is shown in Table 9.

Not CO Groups	PRE	POST	"P value"
Promoted	0.2663	0.2552	0.7799
Retired	0.5547	0.2828	~ 0
Passed Over	0.1790	0.4621	~ 0

Table 9. Comparison of Passed Over, Retired, and Promoted Proportions of the Pre-CSB Not CO and Post-CSB Not CO Groups.

The original postulations for this comparison were based on the fact that along with selection of Commanding Officers, the Command Screening Process is indirectly selecting officers who will not be Commanding Officers. Therefore, if the process is now more effective, officers who were not Commanding Officers should be less successful than non-Commanding Officers prior to the Command Screening Process, as measured by these criteria.

The promotion and passed over proportions are in the relative order as was postulated, in fact the passed over relationship was such even to a statistically significant degree. These results indicate that the non-commanders, since the Command Screening Process was instituted, are not as effective officers as those who did not command under the prior method of selection.

The results of the proportions of officers that retired from each group were not as anticipated. The *Pre-CSB Not CO* group voluntarily retired at a much greater rate than

the current rate of the *Post-CSB Not CO* group. This may be explained by the fact that the Command Screening Board meets annually. If an officer is not selected in one year, he still may be selected the following year when there are new members on the board. Perhaps this keeps an officer's hopes alive and subsequently the officer remains in the Marine Corps vice retiring.

The *Not CO* groups have had quite a substantial change in their preferences for terminal conditions since the institution of the Command Screening Process. Over 71% of the *Post-CSB Not CO* group, but only 45% of the *Pre-CSB Not CO* group, awaited the Colonel promotion board.

## **5. Summary**

Since this is a statistical analysis of the Command Screening Program, only results which were statistically significant should be highlighted. The detailed discussion above has discussed positive and negative trends in the proportions, specifying if the trend is statistically significant or not.

Statistically, if an officer is a Commanding Officer during the "Post" Command Screening Process, his chance of being promoted, retired, or passed over is about the same as if he commanded prior to the Command Screening Process. If an officer is not a Commanding Officer during the "Post" Command Screening Process, he has about the same probability of being promoted, a higher probability of being passed over, and a lower probability of voluntarily retiring than did his peer in the "Pre" Command Screening Process era.

## **C. PROMOTED TO COLONEL BEFORE, WITHIN, OR AFTER THE PRIMARY ZONE**

The previous section examined the three terminal events in the career of a Lieutenant Colonel in the Marine Corps. The officer either was promoted, retired voluntarily or was passed over. The MOE examined in this section will look at just a piece of the previous data, the promotions, and conduct more detailed analysis.

Given that an officer is promoted, there are three possible time frames when the event occurs, "early," "on time," or "late." This classification is dependent on whether he

was promoted prior to, within, or after the year for which he was in the primary zone for the Colonel promotion board.

The "eligible" list for Colonel promotion boards was not available, therefore the "begin date" of an officer's first Lieutenant Colonel fitness report determined the year for which he was in the primary zone for consideration of promotion to the rank of Colonel. The "fitness report determined eligible date," the date that each year's Colonel Promotion List started promoting and finished promoting (cleared), and an officer's first Colonel fitness report's "begin date" were compared to determine whether an officer was promoted early, on time, or late. The Colonel's Promotion List information was obtained from HQMC, Officer Promotion Branch (Code MMPR1). If an officer was frocked and given a fitness report at the time, then he will be a member of the early category, as discussed in Chapter II, Section B.

Because of the lack of actual information on Colonel Promotion Boards concerning early, on time, and late promotions, the numbers computed for each classification, and therefore the proportions, are estimates only. These proportions however, are still valid for comparison purposes because they are all figured consistently, so each group has the same bias (if any) for each promotion year. The degree to which the proportions for two groups differ, and the corresponding "P value" of the proportion test, identify if the proportions are statistically the same or different. The results of the proportion tests will be compared to the postulations given in Section B of Chapter III, so that it can be determined if by these measures, the Command Screening Board is choosing more effective Commanding Officers than the previous method of selection.

There are 19 officers within the *Post-CSB CO* group qualified to participate in this portion of the analysis. For each of the proportions of the *Post-CSB CO* group represented in the subsections that follow, one officer accounts for a little more than five percent of the proportion. Results are determined based on the data as it stands. The proportions are comprised of the numbers presented in Appendix B.

- 1. Comparison of the CO and Not CO Groups Prior to the Command Screening Process**

The proportions of officers from the groups, and results of the proportion tests between the two groups, concerning promotions to the rank of Colonel are in Table 10.

Pre-CSB Groups	CO	Not CO	"P value"
early	0.1892	0.1333	<b>0.1049</b>
on time	0.6328	0.6278	<b>0.9726</b>
late	0.1781	0.2389	<b>0.0852</b>

**Table 10. Comparison of Early, On Time, and Late Promotion Proportions of the *Pre-CSB CO* and *Pre-CSB Not CO* Groups.**

In none of the comparisons do the proportions differ by a statistically significant degree, however all of the relationships between the proportions are as postulated. The Commanding Officer group has a higher proportion of early and on time promotions and a lower proportion of late promotions than officers who did not command. The late promotion comparison has the smallest "P value" seen in these pairwise comparisons (as well as in all the future pairwise comparisons of this section). A "P value" of 0.0852 means that the results "almost" show a statistically significant higher late promotion rate among the *Not CO* group than among *CO* group, which is the expected relationship.

The results of the above tests support the premise of a relative advantage that commanders have over officers who do not command, (although not statistically significantly so) under the previous method for selection of Commanding Officers.

## **2. Comparison of the CO and Not CO Groups Under the Command Screening Process**

The proportions of officers from the groups, and results of the proportion tests between the two groups, concerning promotions to the rank of Colonel are in Table 11.

Post-CSB Groups	CO	Not CO	"P value"
early	0.2632	0.1757	<b>0.5923</b>
on time	0.6842	0.6351	<b>0.8965</b>
late	0.0526	0.1892	<b>0.2740</b>

**Table 11. Comparison of Early, On Time, and Late Promotion Proportions of the *Post-CSB CO* and *Post-CSB Not CO* Groups.**

The relationship between the proportions of the *CO* group and the *Not CO* group is as postulated for the early, on time, and late promotions, similarly to the "Pre"

Command Screening Board era. However, once again, the "P values" show that the null hypothesis can not be rejected in any of these comparisons, meaning that none of the differences are statistically significant. It can still be stated that the same advantage that commanders had over officers who do not command under the previous method of selection of Commanding Officers remains to be true for commanders selected by the Command Screening Board.

### 3. Comparison of the CO Groups, Prior and Post Command Screening Process

The proportions of officers from the groups, and results of the proportion tests between the two groups, concerning promotions to the rank of Colonel are in Table 12.

CO Groups	PRE	POST	"P value"
early	0.1892	0.2632	<b>0.6089</b>
on time	0.6328	0.6842	<b>0.8281</b>
late	0.1781	0.0526	<b>0.2658</b>

**Table 12. Comparison of Early, On Time, and Late Promotion Proportions of the *Pre-CSB CO* and *Post-CSB CO* Groups.**

The proportion comparisons are all supportive of the Command Screening Process, although none of them to a statistically significant degree. More of the commanders selected by the Command Screening Process are promoted early and on time, with fewer being promoted late. This indicates that a higher quality officer is filling commanding officer billets than used to be the case.

### 4. Comparison of the Non-CO Groups, Prior and Post Command Screening Process

The proportions of officers from the groups, and results of the proportion tests between the two groups, concerning promotions to the rank of Colonel are in Table 13.

Not CO Groups	PRE	POST	"P value"
early	0.1333	0.1757	<b>0.5007</b>
on time	0.6278	0.6351	<b>0.9121</b>
late	0.2389	0.1892	<b>0.4857</b>

**Table 13. Comparison of Early, On Time, and Late Promotion Proportions of the *Pre-CSB CO* and *Post-CSB CO* Groups.**

As was the case in Section B of this chapter, the postulations for this comparison were based on the fact that along with selection of Commanding Officers, the Command Screening Process is indirectly selecting officers who will not be Commanding Officers. Therefore, officers who were not Commanding Officers under the new process should be less effective than the non-Commanding Officers prior to the Command Screening Process, as measured by these criteria.

However, in this case, none of the relationships between the proportions of the *Pre* and *Post Not CO* groups were as postulated. Since not selected to command, and in view of the above paragraph, the *Post-CSB Not CO* group should be more frequently promoted late if at all. Instead, the results indicate that the officers not selected by the Command Screening Process are still of a higher quality (more effective) than officers not selected for command under the previous era.

## **5. Summary**

It is striking that all of the "P values" are quite high for the on time promotions in each comparison, indicating all groups have nearly identical on time proportions. This means that generally, there is not any difference between *CO* and *Not CO* groups proportions, nor between *Pre* and *Post* groups.

The detailed discussion above has discussed positive and negative trends in the proportions, specifying if the trend is statistically significant or not. Statistically, if an officer is a Commanding Officer (or not a Commanding Officer) during the "Post" Command Screening Process, his chance of being promoted early, on time, or late is about the same as an officer who commanded (or did not command) prior to the Command Screening Process. Furthermore, there is not a statistically significant difference in the proportion of officers promoted early, on time, or late between those who commanded and those who did not command. This is true both before and after the Command Screening Process was instituted. Because of this, one would conclude that the

Command Screening Process is choosing Commanding Officers “just as effectively, but not more effectively” as the officers chosen by the previous method when judged by these MOEs.

Although not to a statistically significant degree, the trend in the relationship of the proportions for early, on time, and late promotions is in an encouraging direction for the Command Screening Process.

#### **D. COMMANDING OFFICER AS A COLONEL**

This section will examine the four main pairwise comparisons as introduced in Section B of Chapter III, in regard to the number of officers who held Colonel Commanding Officer billets. The size of the populations used to determine the proportions is the same as in section C above. The proportions are comprised of the numbers presented in Appendix B.

The length of command as a Colonel was not determined, nor is this analysis based on a given seniority within the rank of Colonel. The results of the proportion tests are given in Table 14.

<u>Comparison Category</u>	<u>First Group proportion</u>	<u>Second Group proportion</u>	<u>"P value"</u>
Pre-CSB CO and Pre-CSB Not CO	0.5580	0.3167	~ 0
Post-CSB CO and Post-CSB Not CO	0.2105	0.2703	<b>0.8127</b>
Pre-CSB CO and Post-CSB CO	0.5580	0.2105	<b>0.0057</b>
Pre-CSB Not CO and Post-CSB Not CO	0.3167	0.2703	<b>0.5614</b>

**Table 14. Comparison of Proportions of Officers who were Commanding Officers as Colonels.**

The result of the first comparison category indicates that officers who commanded as Lieutenant Colonels, under the prior method of selection of Commanding Officers, had a much higher probability of commanding as Colonels as well. The perceived advantage of Lieutenant Colonel commanders over non-commanders is once again proven to be true to a statistically significant degree for the *Pre-CSB* era. The fourth comparison category, concerning the *Not CO* groups, achieves the postulated results as well, however not enough to be statistically significant. The relationship of the proportions indicate that the



*Post-CSB Not CO* population is not as effective as an officer who did not command prior to the establishment of the Command Screening Process.

The results of the other two comparisons did not achieve the postulated results. The *Post-CSB CO* group has a lower proportion of Colonel Commanding Officers than the *Not CO* group. The results indicate the *CO* population does not have an advantage over officers who do not command in the *Post-CSB* era. The other comparison that does not achieve the postulated result is the one concerning the two *CO* populations. The "*Pre*" group had a much greater proportion of Colonel Commanding Officers than does the "*Post*" group, sufficient to be statistically significant. Neither of these two results is supportive of the Command Screening Process. The best explanation for the outcome of these proportion tests is perhaps the small population size of the *Post-CSB CO* group. Once the group gains more time in service, and with that more promotions to Colonel as well as more seniority at the Colonel rank, the proportions may change.

The conclusion, based on the number of Colonel Commanding Officers, is that the Command Screening Process is not selecting more effective Commanding Officers than the previous method by this measure. Also, there is not a statistically significant difference in the proportion of officers commanding as Colonels between those who commanded and those who did not command as Lieutenant Colonels for the groups after the Command Screening Process was instituted. This is contrary to the *CO, Not CO* relationship that existed before the Command Screening Process was instituted.

#### **E. OFFICERS RETIRING AT THE END OF THEIR COMMANDING OFFICER BILLET**

The MOE in this section conducts proportion tests to examine the propensity of an officer to retire immediately upon the completion of his Commanding Officer tour. There are two opportunities for this occurrence, as either a Lieutenant Colonel or a Colonel Commanding Officer. When using retirement as an MOE to compare the Command Screening Process to the prior method of selection, there is a premise that the selection of a more effective Commanding Officer implies the selection of a more career oriented officer who is determined to spend a longer time in the Marine Corps. The results of the comparison for Lieutenant Colonel Commanding Officers is shown in Table 15.

CO Groups	<u>PRE</u>	<u>POST</u>	<u>"P value"</u>
proportions and test result	0.0734	0.0223	<b>0.0029</b>

**Table 15. Comparison of Proportions of Officers who Retired Immediately at the End of their Lieutenant Colonel Commanding Officer Billet.**

The population sizes eligible for this MOE are the original numbers in the category, 1430 officers for the *Pre-CSB CO* group and 481 officers for the *Post-CSB CO* group. The proportions are comprised of the numbers presented in Appendix B. Although the two proportions may not seem to differ by very much, the "P value" indicates that one must reject the null hypothesis, and conclude the proportions are different.

The proportions show the result that was postulated, in favor of the Command Screening Process to a statistically significant degree. A possible explanation may be that the Commanding Officers prior to the Command Screening Board were generally of retirement eligibility and officers after the Command Screening Board were not. If this were the case then the results could be skewed in favor of the Command Screening Process. The data base does not provide enough information to clarify the reason either way.

The other group to examine with this MOE are officers who retired immediately following Commanding Officer billets as Colonels. Unfortunately, the two "*Post*" populations have not had any occurrences, therefore they can not be included in the comparison. The "*Pre*" comparison is offered as historical data for future studies that wish to compare their result with a *Post-CSB* result that can be derived once more data becomes available about the *Post* groups. Table 16 provides the comparison of the *Pre-CSB* groups.

Pre-CSB Groups	<u>CO</u>	<u>Not CO</u>	<u>"P value"</u>
proportions and test result	0.0399	0.1128	<b>0.0212</b>

**Table 16. Comparison of Proportions of Officers who Retired Immediately at the End of their Colonel Commanding Officer Billet.**

The "P value" in this case is near the borderline for acceptance or rejection of the null hypothesis. One may cautiously reject the null hypothesis, saying the proportions are different. Nevertheless, the relationship of the proportions support the postulation.

## V. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this analysis was to determine whether the Command Screening Program, in effect since 1992, is a "better" system of selecting battalion and squadron Commanding Officers than the prior selection method. Previously, Commanding Generals in that unit's chain of command chose the Lieutenant Colonel commanders from the officers within their division or wing. Four mutually exclusive groups of officers, reflecting whether or not an officer was affected by the Command Screening Process and whether or not he was a Commanding Officer at the rank of Lieutenant Colonel, were analyzed and compared in terms of applicable MOEs.

Each of the conclusions is based on certain assumptions that "qualify" the conclusions in many of the cases. An assessment of the effectiveness of the Command Screening Process should not be reached without reading the discussion of the assumptions in Section A of Chapter III.

### A. CONCLUSIONS

#### 1. MOEs Supportive of the Command Screening Process

The Command Screening Process was found to be more effective in selection of Commanding Officers than the prior method of selection in the below listed areas. If the advantage to the Command Screening Process was such to a statistically significant degree, it is noted by an asterisk (\*).

- A lower proportion of Commanding Officers has been passed over for the rank of Colonel. \*
- A higher proportion of Commanding Officers has been promoted early and on time to Colonel.
- A lower proportion of Commanding Officers has been promoted late to Colonel.
- A lower proportion of Commanding Officers has retired immediately at the end of their Lieutenant Colonel Commanding Officer billet. \*

In addition to the statistical advantages, the Command Screening Process was found to have other attributes, listed below, that are supportive of the program.

- All Lieutenant Colonels in the Marine Corps are considered for Commanding Officer Billets.
- Command assignments are arranged by the monitors who ensure that there is no time gap between Commanding Officers for Marine Corps units.

## **2. MOEs That are Not Supportive of the Command Screening Process**

The Command Screening Process was less effective in selection of Commanding Officers than the prior method of selection by the below listed criteria. If the disadvantage to the Command Screening Process was to a statistically significant degree, it is noted by an asterisk (\*).

- A lower proportion of Commanding Officers has been promoted.
- A higher proportion of Commanding Officers has voluntarily retired. \*
- A lower proportion of Lieutenant Colonel Commanding Officers has become Colonel Commanding Officers. \*

## **3. Summary**

The first tenet of the Command Screening Program is to ensure Marines are led by the most qualified Lieutenant Colonels in the Marine Corps. The conclusion on this tenet is that the most qualified Lieutenant Colonels are leading the Marines, but generally they were before the Command Screening Process also.

The second tenet is to ensure that all Lieutenant Colonels are afforded an equal opportunity to compete for command. By the conduct of an annual board at HQMC, this tenet is being achieved. This certainly gives all officers equal footing in the selection process.

The third tenet is to formalize command assignments. There is not a good MOE to measure this tenet. Essentially, one could say it is accomplished by the conduct of the selection board and subsequent slating of selected officers by the monitors.

The fourth tenet is to eliminate sponsorship and cronyism. Once again, having an annual board that considers all eligible officers is the best measure to ensure this tenet is achieved. Although there may be personal knowledge of some of the Lieutenant Colonels being considered by some board members, a majority vote of the 14 members of the board is required for selection. A couple of board members' personal bias will not be enough to make (or not make) the Lieutenant Colonel a Commanding Officer.

The conclusion of the analysis is that the Command Screening Process is achieving its stated creed. The statistical analysis provides some interesting trends and statistics. There are two MOEs that statistically indicate the process is better, two that indicate it is worse, and the remainder that indicate no statistical difference between Commanding Officers selected by the Command Screening Process and commanders selected by Commanding Generals, the previous method. More career highlights of the majority of officers affected by the Command Screening Process must come to pass before any statistically definitive decisions on the value of the process can be reached. This thesis has established the methodology by which future researchers may prove, one way or the other, whether the Command Screening Process is actually a better method of selection. Having a Command Screening Program does make the selection of Lieutenant Colonel Commanding Officers a fair, formal process, and that makes it worth keeping.

## **B. RECOMMENDATIONS**

An analysis, using the same methodology, needs to be conducted every two years or so to judge the trends as the populations gain more time in service and more time in rank. As discussed throughout this analysis, at this time the lack of follow on career data of officers affected by the Command Screening Process kept the amount of data available for analysis very limited. If an officer had not yet reached a career highlight, such as being in the primary zone for the Colonel promotion board, than he could not be included in the analysis for that MOE.

Future studies of the Command Screening Process may include the "screened, not slated" officers as a separate category. The challenge that arises when trying to accomplish this is that an officer's status changes year by year if he is eligible for more than one Command Screening Board. The majority of officers eligible for the board in year "x" are also eligible in year "x + 1." For example, between 20 to 36 percent of the

officers in the "screened, not slated" category went on to be "screened and slated" the following year, depending on the year in question. This could lead to a Markovian analysis where the possible states in which a Lieutenant Colonel can be in any one year are:

- Not Eligible
- Not Screened
- Screened, Not Slated
- Screened and Slated
- In Command

Transition rates among the states could be estimated by using the data available from the four years of Command Screening Board results (FY93 - FY96). The FY98 results will soon be released also. The goal of such an analysis would be to answer such questions as "What proportion of officers who are in one of the above states will be screened and slated at some future date?" This is of great interest to career counselors at the branch of HQMC whom Marine Corps officers consult to determine the types of assignments needed for career enhancement and their likelihood of success with future promotion boards.

## APPENDIX A. NUMBER OF OFFICERS FOR EACH CATEGORY

<u>Category</u>	<u>Number in Category</u>
Pre-CSB CO	1430
Post-CSB CO	481
Pre-CSB Not CO	687
Post-CSB Not CO	819
Total	3417





## APPENDIX B. NUMBERS FOR DETERMINING PROPORTIONS

	Pre-CSB Groups		Post-CSB Groups	
	<u>CO</u>	<u>Not CO</u>	<u>CO</u>	<u>Not CO</u>
Promotion to Colonel	629/1258	180/676	19/42	74/290
Retired	304/1258	375/676	14/42	82/290
Passed Over	325/1258	121/676	9/42	134/290
Early	119/629	24/180	5/19	13/74
On Time	398/629	113/180	13/19	47/74
Late	112/629	43/180	1/19	14/74
Colonel CO	351/629	57/180	4/19	20/74
Retire From LtCol CO Billet	105/1430	na	6/269	na
Retire From Col CO Billet	14/351	7/57	na	na
Relieved from Command	7/1430	na	4/269	na



## LIST OF REFERENCES

1. U.S. Marine Corps Order 1300.64, 26 January 1995.
2. Director, Personnel Management Division, Headquarters Marine Corps, e-mail communication, [undated].
3. U.S. Marine Corps ALMAR 195-96, 19 March 1996.
4. U.S. Marine Corps ALMAR 121-95, 14 April 1995.
5. Commanding General, Marine Corps Combat Development Command, "Current Utility and Output of the Command Screening Program," Memorandum for the Assistant Commandant of the Marine Corps, 1 July 1996.
6. Fuentes, Gidget, (10 June 1996, Marine Corps edition). "Command screening lists won't be public," Navy Times p. 4.
7. Anderson, Jon R., (9 September 1996, Marine Corps edition). "Who's up for command assignment?," Navy Times, p. 4.
8. Anderson, Jon R., (30 June 1997, Marine Corps edition). "Corps' command screening results go public again," Navy Times p. 4.
9. Inspector General (staff), Headquarters Marine Corps, e-mail communication, 14 November 1996.
10. U.S. Marine Corps Order P1610.7, 3 March 1995.
11. Larsen, R. J. & Marx, M. L. (1986). An Introduction to Mathematical Statistics and Its Applications (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
12. S-Plus Guide to Statistical & Mathematical Analysis (version 3.3). (1995). Seattle, WA: MathSoft, Inc.
13. Devore, Jay L. (1995). Probability and Statistics for Engineering and the Sciences (4th ed.). Belmont, CA: Wadsworth, Inc.



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